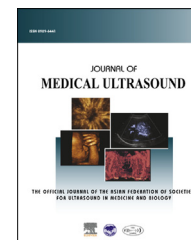


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.jmu-online.com](http://www.jmu-online.com)

## CASE REPORT

# Lingual Thyroid: Ultrasound Assessment and Diagnosis

Che-Yi Lin <sup>1,2</sup>, Tsung-Lin Yang <sup>1\*</sup>

<sup>1</sup> Department of Otolaryngology, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, and <sup>2</sup> Department of Otolaryngology-Head and Neck Surgery, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan

Received 15 May 2014; accepted 9 June 2014

Available online 28 August 2014

## KEY WORDS

ectopic thyroid,  
lingual thyroid,  
ultrasonography

The lingual thyroid occurring in the midline of the tongue base is an uncommon congenital anomaly. We report the case of a 43-year-old female who presented with a long-term lumping sensation. Head and neck ultrasonography revealed a solid tumor located in the tongue base without any thyroid tissue identified in the orthotopic position of the thyroid gland. With normal thyroid function and the cytological reports of ultrasound-guided fine needle aspiration (FNA), the diagnosis of an ectopic thyroid gland was confirmed. The utility of head and neck ultrasound in diagnosing ectopic thyroid glands is emphasized in this report.

© 2014, Elsevier Taiwan LLC and the Chinese Taipei Society of Ultrasound in Medicine.

Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/4.0/).

## Introduction

Development of thyroid glands begins around 24 days after fertilization from a median endodermal thickening in the floor of the primitive hypopharynx, which appears as a diverticulum of foramen cecum. The thyroid primordium migrates anteriorly to the developing hyoid bone, and then descends into its final destination at the lower neck. Failure of migration gives rise to residual thyroid tissue, resulting in

ectopic thyroid glands [1]. The ectopic thyroid gland is an uncommon entity with female preponderance [2,3]. It is mostly found in the lingual area, followed by the prehyoid region and the thyroglossal duct tract. Some reports also showed the possibility of finding ectopic thyroid glands in the lateral neck, aerodigestive tract, and mediastinum [4]. In this study, we report a case of ectopic thyroid gland diagnosed by head and neck ultrasound.

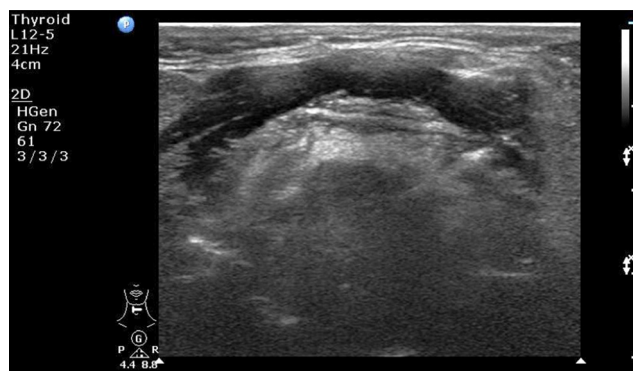
## Case Report

A 43-year-old female patient presented with a history of a lumping throat for over 10 years. This symptom happened frequently in recent months, and also the sensation of foreign body and food stasis in the throat. The patient also complained of discomfort in the submental area near the

Conflicts of interest: All authors declare no conflicts of interest.

\* Correspondence to: Dr. Tsung-Lin Yang, Department of Otolaryngology, National Taiwan University Hospital and National Taiwan University College of Medicine, Number 1, Section 1, Jen-Ai Road, Taipei 100, Taiwan.

E-mail address: [yangtl@ntu.edu.tw](mailto:yangtl@ntu.edu.tw) (T.-L. Yang).<http://dx.doi.org/10.1016/j.jmu.2014.06.005>0929-6441/© 2014, Elsevier Taiwan LLC and the Chinese Taipei Society of Ultrasound in Medicine. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/4.0/).

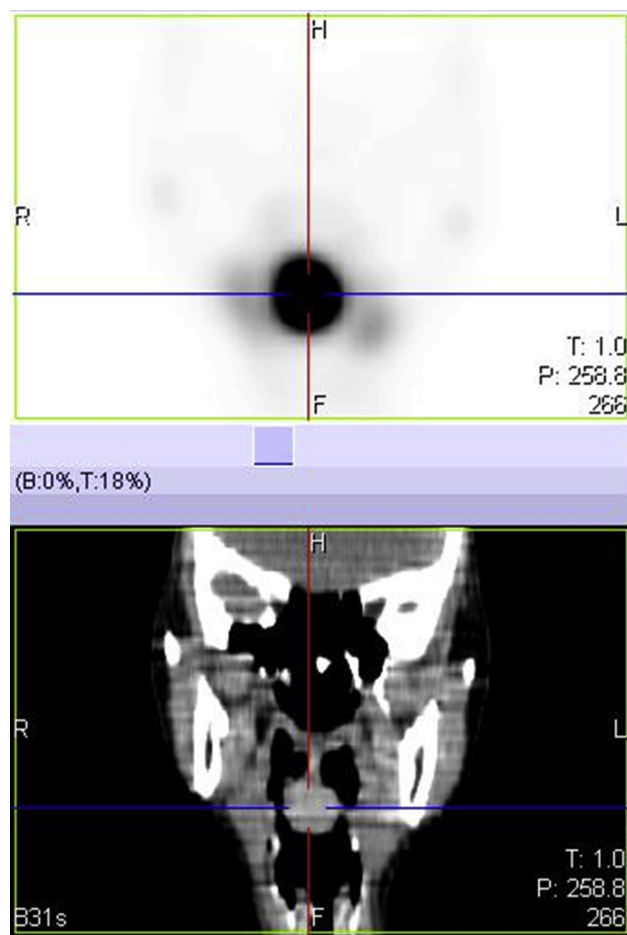


**Fig. 1** A low-echogenicity solid mass was found at the tongue base. Ultrasound-guide fine needle aspiration was performed and the cytological report confirmed the diagnosis of lingual thyroid gland.

hyoid bone. She denied any episodes of pain or odynophagia. She had visited local medical clinics and was treated as having chronic pharyngitis. Because of persistent symptoms, she was referred to our hospital for further management. Physical examination of the fields of otolaryngology and head neck showed a tumor located in the midline of the tongue base. This lesion had a smooth surface, soft content, and a normal mucosal lining.

A Philips HD15 PureWave ultrasound scanner (Royal Philips, Amsterdam, The Netherlands) equipped with an L12-5 50 mm linear array transducer (2.1 MHz) and real time color Doppler (5.7 MHz) transducers was used for head and neck sonographic examinations. Using ultrasound, a solid, homogenous, and hypoechoic tumor was found in the midline of the tongue base (Fig. 1). No thyroid tissue could be identified in the orthotopic anatomical position of the thyroid glands (Fig. 2). Contrast-enhanced computed tomography (CT) demonstrated similar findings with a solid tumor with contrast enhancement in the tongue base. Only the tongue base was highlighted in the isotopic thyroid scan. No thyroid glands were identified in the orthotopic anatomical position (Fig. 3).

Because of the clinical presentations and imaging results, a presumptive diagnosis of ectopic lingual thyroid was impressed. Normal thyroid function tests were confirmed. Ultrasound-guided fine needle aspiration (FNA) was

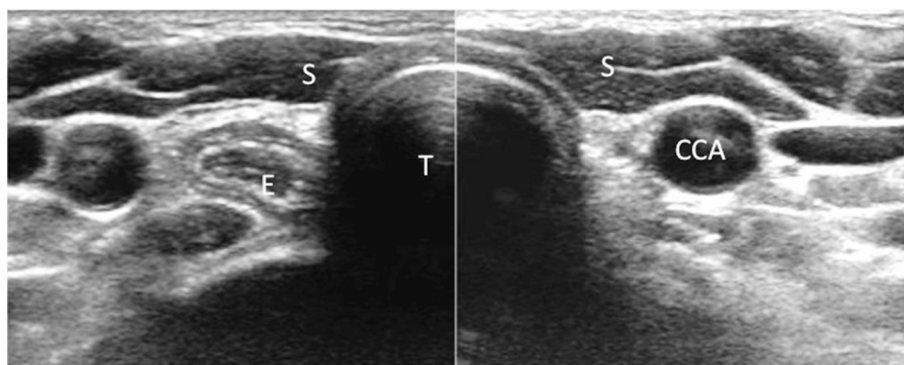


**Fig. 3** The thyroid scan with computed tomography (CT) confirmed the diagnosis of lingual thyroid.

performed for the tumor, and the cytological analysis revealed benign thyroid cells. According to the findings, an ectopic thyroid at the tongue base was diagnosed.

## Discussion

The clinical presentation of ectopic thyroid varies, because of the locations and sizes. Most cases of lingual thyroid



**Fig. 2** No thyroid tissue was found in the orthotopic position of thyroid glands. CCA = common carotid artery; E = esophagus; S = strap muscle; T = trachea.

are asymptomatic. Some patients are diagnosed during adolescence or pregnancy, because of tumor enlargement induced by elevated thyroid hormones. Some patients present the symptoms of dysphagia, odynophagia, dysphonia, or dyspnea. Generally, the function of ectopic thyroid tissue is prone to be insufficient because hypothyroidism is found in one-third of the patients. It has been reported that the ectopic thyroid is the only functional thyroid tissue in 75% of these patients [5]. Permanent hypothyroidism may occur when the ectopic thyroid glands are removed.

The diagnosis of lingual thyroid is largely dependent on clinical awareness [3]. Once this disease is suspected, a complete thyroid functional test and the imaging tools are required. The diagnostic battery includes head and neck ultrasonography, scintigraphy, CT, and magnetic resonance imaging (MRI) [4]. The radionuclide scanning provides an approximate estimation of the size, the degree of activity, and the location of ectopic thyroid glands. CT or MRI can be helpful in determining the location and dimensions of both ectopic thyroid gland and orthotopic thyroid tissue [6].

The head and neck ultrasonography is a noninvasive image tool for evaluation of the presence of ectopic and orthotopic thyroid tissue, especially when scintigraphy is unavailable or contraindicated [6,7]. Using transversal and longitudinal scanning, especially by a curve scanner with a low frequency, a thorough evaluation of the size and location of the glandular tissue, as well as the echogenicity of ectopic and orthotopic thyroid glands, can be revealed. The sonographic picture of lingual thyroid usually presents a solid tumor with low level echogenicity, which is comparable with the typical thyroid parenchyma [7]. The real-time color Doppler technique increases the sensitivity of detecting ectopic thyroid tissue compared to the conventional gray scale ultrasonography by the color flow pattern of the lesion [6]. Furthermore, ultrasound-guided FNA is a useful procedure to obtain definite cytological diagnosis of the ectopic thyroid lesions, especially for those suspected of malignant transformation [4,8].

Treatment of ectopic thyroid is dependent on the function level and the cytological diagnosis. Observation is suggested for most euthyroid patients without symptoms. It is especially important for those whose ectopic thyroid gland is the only functional gland within the body [3]. In a symptomatic ectopic thyroid, hormonal suppression therapy is used to reduce the size of the gland. Surgical intervention

is only recommended for patients suffering from tumor progression, dysphagia, and airway obstruction [9].

In our patient, the sonographic features were compatible with previous reports [2,7,10]. The thyroid function was also unremarkable. FNA confirmed the benign nature of the functional lingual thyroid gland. Observation was suggested for this patient. In the follow-up with ultrasonography, no abnormal finding has yet been detected.

In conclusion, lingual thyroid must be kept in mind when a tongue base tumor is encountered. Although it is rare, it still needs a thorough evaluation before surgical intervention. In addition to direct laryngoscopic examination, head and neck ultrasonography with color Doppler imaging is a useful technique to check the missing orthotopic thyroid glands, and also to identify the presence of ectopic thyroid tissue [10]. The ultrasound-guided FNA, in particular, is beneficial to confirm the diagnosis of functional lingual thyroid gland without radioiodine intervention, and also to detect the possibility of tumor formation.

## References

- [1] Moore KLPT. The developing human. Philadelphia: WB Saunders Company; 1993.
- [2] Giovagnorio F, Cordier A, Romeo R. Lingual thyroid: value of integrated imaging. *Eur Radiol* 1996;6:105–7.
- [3] Ulug T, Ulubil SA, Alagol F. Dual ectopic thyroid: report of a case. *J Laryngol Otol* 2003;117:574–6.
- [4] Prado H, Prado A, Castillo B. Lateral ectopic thyroid: a case diagnosed preoperatively. *Ear Nose Throat J* 2012;91:E14–8.
- [5] Wong RJ, Cunningham MJ, Curtin HD. Cervical ectopic thyroid. *Am J Otolaryngol* 1998;19:397–400.
- [6] Tang MH, Caruso PA, Cunningham MJ. Radiology quiz case 2. Dual ectopic subhyoid and lingual thyroids. *Arch Otolaryngol Head Neck Surg* 2007;133:941–2. 943–4.
- [7] Miller JH. Lingual thyroid gland: sonographic appearance. *Radiology* 1985;156:83–4.
- [8] Cordes S, Nelson JJ. Papillary carcinoma arising in median ectopic thyroid tissue: management of the thyroid gland. *Ear Nose Throat J* 2010;89:E4–7.
- [9] Toso A, Colombani F, Averono G, et al. Lingual thyroid causing dysphagia and dyspnoea. Case reports and review of the literature. *Acta Otorhinolaryngol Ital* 2009;29:213–7.
- [10] Ueda D, Yoto Y, Sato T. Ultrasonic assessment of the lingual thyroid gland in children. *Pediatr Radiol* 1998;28:126–8.